Catalogue of American Amphibians and Reptiles.

ROSSMAN, DOUGLAS A., AND ROBERT POWELL. 1985. *Clonophis, C. kirtlandii.*

Clonophis Cope
Kirtland's Snake

Clonophis Cope, 1889:391. Type species, *Regina kirtlandii* Kennicott, 1856, by monotypy.

• CONTENT. A single species, *Clonophis kirtlandii,* is recognized. See species account.

• DEFINITION. *Clonophis* is a small (maximum total length: 622 mm), moderately stout natricine snake. The head is barely wider than the neck, narrowing gradually to the region of the nasals; the snout is broadly rounded. The eyes are small; their diameter approximately equal to the distance between eye and nostril; the pupil is round. The head scales are normal, usually with 2 nasals, 1 loreal, 1 preocular, 2 postoculars, 1 + 2 temporals; 4-7 (usually 6) supralabials, the 5th usually the largest, the 3rd and 4th entering the eye; 6-9 (usually 7) infralabials. Ventrals number 123-137 in females, 121-135 in males. Subcaudals are divided and number 44-61 in females, 56-69 in males. The anal plate is divided. Dorsal scales are imbricate, strongly keeled, and slightly notched posteriorly with 2 very faint apical pits (apparently absent in many individuals; Conant, 1961). The normal scale row formula is 19-17 with occasional further reduction (as low as 14). Tail length constitutes 19-24% of total length in adult females, 23-28% in adult males. The maxillary teeth are subequal, with all teeth relatively short, stout, and weakly curved. The posterior ends of the pterygoids are practically nondivergent. The basioccipital lacks a ventral process and there is no ventral keel on the parasphenoid. The parietal bone is almost smooth, with no trace of a posteromedian ridge. The prefrontal is a little more than twice as high as long. The interorbital foramen is well developed. The quadrate is greatly expanded dorsally, but the supratemporal somewhat reduced. The dorsal nasal laminae are greatly expanded and in relatively broad contact with the premaxilla and the frontals. The dorsal pattern consists of 4 alternating longitudinal rows of 43-65 rounded black or dark brown blotches on a brown to grayish brown (often with a reddish tinge) ground color. Blotches tend to be indistinct posteriorly. Some specimens may also have, adjacent to the venter, small dark spots that alternate with the lower row of large blotches. The venter is pink to brick red medially, becoming yellow anteriorly, often with dark stippling. Laterally the ventrals are gray with large black spots that form 2 conspicuous rows. The top and sides of the head are black, dark brown, or olive, plain or inconspicuously mottled. The labials, chin, and throat are yellow or cream except for a dark area extending down from the side of the head onto the last supralabial. The last infralabial may have 1 or 2 small black spots. Juveniles are often so dark that the dorsal pattern may be obscured; the venter is bright and similar to that of adults. The everted hemipenis is very weakly bilobed apically. The sulcus spermaticus is simple but slightly sinistral and terminates between raised lips. The apical surface and adjacent apical margin are nude. The remainder of the organ is spinose. The spines are generally small, but slightly larger proximally. At least two of the most proximal spines are large enough that they could be considered basal hooks.

• DESCRIPTIONS, ILLUSTRATIONS, DISTRIBUTION, FOSSIL RECORD. See species account.

• REMARKS. Conant (1943) concluded, largely on the basis of similarities in color pattern, that the closest relative of *Clonophis kirtlandii* is *Nerodia harteri* (both were included in the genus *Natrix* at that time) and that *kirtlandii* is a "degenerate" member of the *sipedon* species group. Smith and Huheey (1960), on the other hand, placed *kirtlandii* with the crayfish snakes in the genus *Regina.* Rossman (1963), largely on osteological grounds, demonstrated that *Clonophis* deserved to be recognized as a separate genus and suggested a possible affinity to *Storeria;* he recognized, however, that their similarities might be due to convergence. Varkey (1979) found that *Clonophis* shares more cranial muscle character states with *Storeria* than with any other thamnophiine genus. Rossman et al. (1982), however, found *Clonophis* to be most similar to *Tropidoclonion* in terms of the relative size and placement of their visceral organs.

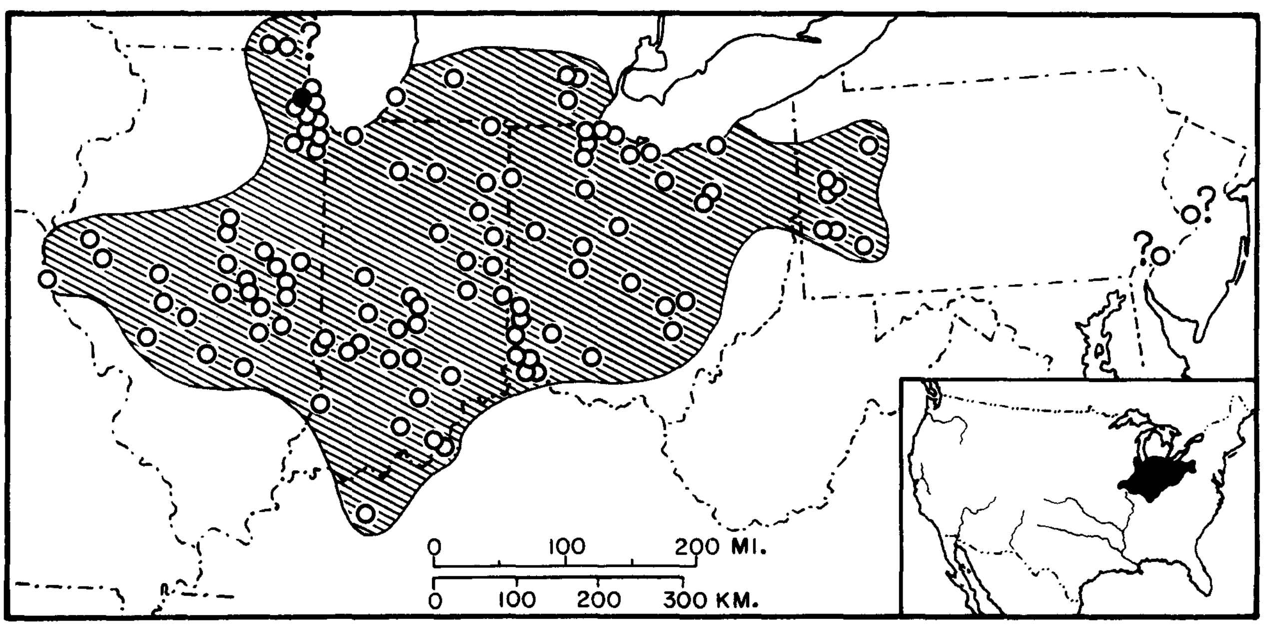
• ETYMOLOGY. It is not clear whether *Clonophis* is derived from the Greek *klon* meaning "twig" and *ophis* meaning "snake," hence a twiglike snake; or from the Greek *klonos* meaning "violent, confused motion," referring to the habit of these snakes to flatten the entire body and writhe when annoyed (H. M. Smith, pers. comm.).

Clonophis kirtlandii (Kennicott)
Kirtland's snake

Regina kirtlandii Kennicott, 1856:95. Type-locality, "Northern Illinois," restricted by Conant (1943) to "West Northfield, Cook County, Illinois." Holotype, U.S. Nat. Mus. 1514, adult female collected by R. W. Kennicott (not examined by authors). Date unknown.

Tropidoclonion kirtlandii: Cope, 1860:340.

Storeria kirtlandi: Jan, 1863:74.



MAP. Solid circle marks type-locality of *Clonophis kirtlandii;* hollow circles indicate other records. Question marks indicate questionable records.

Ischnognathus kirtlandi: Jan, 1865:238.
Tropidoclonium kirtlandii: Cope, 1875:42.
Tropidonotus kirtlandii: Garman, 1883:28.
Clonophis kirtlandii: Cope, 1889:391.
Natrix kirtlandi: Hay, 1892:504.

• CONTENT. *Clonophis kirtlandii* is monotypic.

• DEFINITION. Same as for genus.

• DESCRIPTIONS. Conant (1943) described scutellation, pattern, coloration, dentition, and hemipenes. Nakamura and Smith (1960) described many cranial features. Rossman (1963) discussed a variety of diagnostic features, including many aspects of the skull. Varkey (1979) described the cranial musculature. Rossman et al. (1982) analyzed the topography of several visceral organs.

• ILLUSTRATIONS. Black and white photographs are in Conant (1943), Smith (1961), and Minton (1972). Barbour (1971) and Behler and King (1979) provided color photographs. Colored illustrations are in Conant (1975) and Smith and Brodie (1982). The *in situ* hemipenis was figured by Cope (1895), the skull by Nakamura and Smith (1960), and the cranial musculature by Varkey (1979).

• DISTRIBUTION. The species ranges from northeastern Missouri (Jones, 1967) and southeastern Wisconsin (although Vogt, 1981, rejected the Wisconsin records) through Illinois, southern Michigan, most of Indiana and Ohio to western Pennsylvania and north-central Kentucky (Conant, 1943). Tucker et al. (1977) reported additional localities in Illinois, Indiana, Kentucky, and Ohio. Further distributional data are available for the following states: Illinois (Clark, 1961; Smith, 1961; Holman and Arai, 1962; Moll, 1962; Munyer and Parmalee, 1967; Brown et al., 1975), Indiana (Holman, 1960; Minton, 1972), Kentucky (Barbour, 1971), and Ohio (Adler, 1958; Ashton, 1976). In addition, two records exist from the Delaware Valley in eastern Pennsylvania and adjacent New Jersey; Conant (1943) stated that these are of doubtful origin and, if the species ever occurred there, it probably has been extirpated.

This species generally inhabits wet meadows and, more rarely, adjacent woodland; several populations are known from urban areas (Conant, 1938, 1943, 1975; Smith, 1961; Barbour, 1971; Minton, 1972). Conant (1943) stated that *Clonophis* is a typical snake of the Prairie Peninsula, where it has survived as a relict of the postglacial period when prairie conditions were at their maximum. Brown et al. (1975) stated that the species may be becoming extirpated in the western edge of its range due to gradual drying up and cultivation of the wet prairies. B. L. Monroe of the University of Louisville (pers. comm.) stated that "in recent years, it has become quite rare (average one specimen every two years) compared to literally hundreds back in the 1930's and 1940's."

• FOSSIL RECORD. None.

• PERTINENT LITERATURE. Geographic variation and many aspects of life history were described by Conant (1943), the birth of a brood by Tucker (1976), and food habits by Tucker (1977).

• ETYMOLOGY. The name *kirtlandii* honors Jared P. Kirtland, an early Ohio physician and naturalist.

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